Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Revision of the Commission's Rules to	)	CC Docket No. 94-102
Ensure Compatibility with Enhanced	)	
911 Emergency Calling Systems	)	
	)	
Wireless E911 Phase II Implementation	)	
Plan of Nextel Partners, Inc.	)	

NEXTEL PARTNERS, INC.
PHASE I AND PHASE II E911 QUARTERLY REPORT
NOVEMBER 1, 2002

To: Chief, Enforcement Bureau
Chief, Wireless Telecommunications Bureau

INTRODUCTION

Pursuant to the October 12, 2001 Order of the Federal Communications Commission ("Commission") in CC Docket No. 94-102,[1] Nextel Partners, Inc. respectfully submits this Enhanced 911 ("E911") Quarterly Report on its implementation of Phase I and Phase II E911. Herein, Nextel Partners provides an update on all relevant events impacting handset upgrades and network infrastructure necessary to enable Phase II E911 location capabilities as well as a listing of all pending requests for Phase I and Phase II E911 service and the status of each request.

Nextel Communications ("Nextel Communications") and Nextel Partners (collectively referred to herein as "Nextel") achieved their first benchmark date, October 1, 2002, when it began selling an Assisted Global Positioning Satellite ("A-GPS")

[1] *In the Matter of Revision of the Commission's Rules To Ensure Compatibility With Enhanced 911 Emergency Calling Systems, Wireless E911 Phase II Implementation Plan of Nextel Communications, Inc. and Nextel Partners, Inc.,* Order, CC Docket No. 94-102, FCC 01-295, released October 12, 2001 ("Nextel Waiver Order").

handset. Further, both Nextel Communications and Nextel Partners have deployed several public safety answering points ("PSAPs") throughout the country with Phase II service and continue to work to deploy the remaining pending Phase II requests.[2]

Herein, Nextel Partners explains, in detail, the activities both companies have experienced in deploying their first Phase II PSAP in York County, Virginia and Cattaraugus County, New York. Since filing its August 1, 2002 Quarterly Report ("August Report"), Nextel has learned a great deal about the "real-world" deployment of Phase II services. Most significantly, Nextel has learned, as Mr. Dale Hatfield recently stated, "there is complexity in every dimension" of Phase II E911 service.[3] While some of these complexities such as successfully launching the sale of an A-GPS handset are behind Nextel, numerous deployment hurdles remain and many of these are not predictable, controllable or easily resolved. Nextel Communications' York County experience provides an important insight into the deployment process and, moreover, foreshadows the difficulties and complexities that every wireless carrier and PSAP are likely to face as Phase II E911 services are deployed throughout the country.

BACKGROUND

On November 9, 2000 Nextel Communications and Nextel Partners requested a waiver of the Commission's Phase II E911 rules to permit the launch of compliant Phase

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[2] Nextel has deployed Phase II service with York County, Virginia, St. Clair County, Illinois, Hampton, Virginia and Bond County, Illinois. Nextel Partners has deployed Phase II service with Cattaraugus County, New York, Roanoke, Virginia, and early next week we expect to launch Vigo County, Indiana.

[3] "A Report on Technical and Operational Issues Impacting the Provision of Wireless Enhanced 911 Services," Prepared for the Federal Communications Commission by Dale N. Hatfield (hereinafter, the "Hatfield Report"), at page 18. *See also* Public Notice, "Wireless Telecommunications Bureau Seeks Comment on Report on Technical and Operational Wireless E911 Issues," WT Docket No. 02-46, DA 02-2666, released October 16, 2002.

II E911 service on October 1, 2002, one year after the Commission's implementation deadline.[4] Because Nextel's Phase II E911 technology is a handset-based A-GPS solution, Nextel also sought relief from the Commission's handset penetration rates and associated benchmark dates. In the Nextel Waiver Order, the Commission granted Nextel's requested relief by imposing the following Phase II E911 implementation plan:

October 1, 2002:	Begin selling and activating A-GPS-capable handsets;
December 31, 2002:	Ensure that at least10% of all new handsets activated are A-GPS-capable;
December 1, 2003:	Ensure that at least 50% of all new handsets activated are A-GPS-capable;
December 1, 2004:	Ensure that 100% of all new digital handsets activated are A-GPS-capable;
December 31, 2005:	95% of all subscriber handsets in service are A-GPS-capable.[5]

SUMMARY OF IMPLEMENTATION EFFORTS TO DATE

As the Commission is aware, Nextel and Motorola have been developing an A-GPS capability for the integrated digital enhanced network ("iDEN") technology since the Fourth Quarter 2000, prior to the Commission granting Nextel's waiver request. Unlike other wireless technologies and air interfaces, iDEN handsets and infrastructure, which are Motorola proprietary technologies, did not have a readily available location

[4] *Nextel Communications, Inc. and Nextel Partners, Inc. Joint Report on Phase II Location Technology Implementation and Request for Waiver*, filed November 9, 2000 in CC Docket No. 94-102.

[5] *In the Matter of Revision of the Commission's Rules To Ensure Compatibility With Enhanced 911 Emergency Calling Systems, Wireless E911 Phase II Implementation Plan of Nextel Communications, Inc. and Nextel Partners, Inc.,* Order, CC Docket No. 94-102, FCC 01-295, released October 12, 2001 at ¶37 ("Nextel Waiver Order").

capability to support Phase II E911 service.[6] Consequently, Nextel was compelled to compensate Motorola for the design, development and integration, from scratch, an A-GPS capability in iDEN handsets and infrastructure. The timeline set forth above required that Motorola's efforts commence as soon as possible to provide at least 24 months of development and testing time prior to commercial launch. Since the Fourth Quarter 2000 Nextel, Motorola and others have devoted substantial resources to develop, test and install network hardware and software and to develop, test and launch an A-GPS capable handset.

DISCUSSION

A. Launch of the i88s A-GPS Capable Handset

On October 1, 2002 Nextel achieved its first Phase II implementation benchmark when it began selling and activating its first A-GPS capable handset, the i88s.[7] A second A-GPS handset model currently is scheduled to launch by the end of the Fourth Quarter 2002. Prior to the October 1, 2002 launch, Nextel, via an independent third-party consultant, completed accuracy testing of the A-GPS handset and met the Commission's standards for a handset-based Phase II solution.

B. Network Infrastructure

Although Nextel's Phase II solution is handset-based, substantial network infrastructure upgrades are required to successfully transmit a caller's location information through Nextel's network to a PSAP. Launching a complicated technology

[6] As Nextel has noted previously in this proceeding, Motorola's iDEN technology is an "island" technology for Phase II E911 purposes.

[7] The Commission states "Nextel must report, in the Quarterly Report immediately following the benchmark date: (1) for the October 1, 2002 benchmark, a statement of whether Nextel has begun selling and activating a single A-GPS handset model and, if so, on what date." *See* Nextel Waiver Order at ¶32.

to first calculate, and then deliver, location information from an iDEN handset to a PSAP, particularly in the compressed timeline demanded by the Nextel Waiver Order, required unprecedented efforts and coordination among numerous entities. Moreover, introducing this intricate, new technology in the public safety community, prior to extensive use in a commercial services arena, has created an added layer of complexity and deliberation.

In addition to the months of research, development and testing that were devoted to launching an A-GPS capable handset,[8] Nextel and Motorola had to develop, test and deploy new network infrastructure—never before used in Nextel's iDEN architecture—and develop, test and deploy new software throughout Nextel's network to enable the use of this additional infrastructure. By the beginning of August, Nextel had installed all of these new network infrastructure and software components necessary to test Phase II service in a live environment. Throughout August and into the beginning of September, Nextel upgraded each of its Base Station Controllers ("BSCs") and Enhanced Base Transceiver Systems ("EBTSs"), which numbered into the thousands, in all of its markets where it had received valid Phase II requests. By upgrading these network components, Nextel was prepared to deploy valid Phase II requests in these geographic locations.

As Nextel has learned since its August Report, no amount of lab or field testing could have ensured that the voice and location data from an A-GPS handset would be successfully transmitted from the Nextel network, through national and regional automatic location identification ("ALI") databases, to the PSAP. Only by initiating testing in a live market with an upgraded PSAP would Nextel encounter the plethora of

[8] Nextel's February, May and August 2002 Quarterly Reports provided detailed information on the processes that resulted in the October 1st launch of the A-GPS iDEN handset.

potential hardware, software and connectivity issues that might prevent a successful Phase II call.

C. Establishing End-to-End Connectivity—Nextel's First Office Application

When Nextel filed its August Report, it had just started to validate its Phase II solution in a live market, referred to as a First Office Application ("FOA") test, in York County, Virginia. The Phase II FOA used Nextel's live network equipped with all necessary Phase II equipment, infrastructure and software upgrades to transmit location information to a live PSAP. Nextel originally anticipated exiting its FOA on August 21, 2002; however, the unanticipated level of complexity required to stabilize the end-to-end connectivity from Nextel's network to the PSAP, including never-before used infrastructure,[9] such as Intrado's wireless national ALI ("WNALI") database, local exchange carrier ("LEC")-controlled Phase II-ready ALI databases, and the PSAP's network, delayed completion of the FOA until October 1, 2002 when York County, Virginia, launched live Phase II E911 service with Nextel.

Specifically, although Nextel's network was properly generating the latitude and longitude of an A-GPS handset, the information was not transmitting from Nextel's GMLC through Intrado's national ALI database, through the LEC's ALI database and to the PSAP. Despite rigorous network and component testing by both Motorola and Nextel prior to engaging in the FOA, Nextel encountered data transmission issues in the FOA that could not have been predicted and resolved prior to entering the FOA.

[9] For example, Nextel installed new Phase II network assist equipment, which improves the performance of the A-GPS capable handset by providing it additional location "assistance" data. The new equipment primarily includes the Gateway Mobile Location Center ("GMLC") and the Serving Mobile Location Center ("SMLC"). The SMLC interfaces with the GPS reference receiver network and Nextel's Mobile Switching Center ("MSC") to provide assistance data to the handset. The GMLC then manages the

When Nextel entered its FOA, other wireless carriers already had deployed their Phase II solutions in York County. Thus, Nextel was working with certain pre-established technical parameters that had been established to deliver Phase II data from those carriers to the PSAP. As Mr. Hatfield noted in his report,

> the complexity of …[launching Phase II E911] is increased by the fact that the wireless carriers in the U.S. (a) employ several different technologies with different air interfaces in the provision of their services and (b) operate across multiple radio frequency bands utilizing channels of varying bandwidth. Moreover, these systems differ in their architectural details, including employing different network elements with different functionality and interfaces.[10]

Nextel experienced end-to-end connectivity issues related to trunking between the LEC's regional ALI database and the PSAP, the configuration of the LEC's selective routers and ALI databases, and the interface between Intrado's WNALI and this LEC's infrastructure, all of which affected the transmission of latitude and longitude from Nextel's network to the PSAP. Nextel worked carefully to troubleshoot and resolve these issues while carefully protecting the integrity of other carriers' Phase II services. The myriad of connectivity issues Nextel faced primarily manifested themselves as initial call failures and out-of-sync timers. The cause of initial call failures was quickly determined and resolved soon after the FOA commenced. The timer issues, however, which resided primarily in the configurations of and interconnections between the Intrado database, the LEC network and the PSAP's equipment, required substantial time and resources to resolve.

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interface between the MSC and the PSAP to ensure that the location information is properly transmitted from Nextel's network to the PSAP's network.

[10] The Hatfield Report at p. 19.

Each component necessary for the successful transmission of latitude/longitude data from Nextel's network, through the Intrado and LEC networks, to the PSAP contains various timers that support the sending and receipt of timely and accurate Phase II location information. Nextel's network timers, the national and regional ALI database timers, LEC timers and PSAP timers (collectively, the "network timers") all must be synchronized to successfully transmit location information from Nextel's network to the PSAP. A slight "miss" in any of these various timers can have an enormous downstream effect on other network timers, to the point of blocking or delaying Phase II location data transmission. For example, if a PSAP's timers are set to bid for location information before Phase II information has been calculated by Nextel's network, insufficient caller location information may be provided to the PSAP. Prior to entering the FOA, Nextel had tested and resolved all handset and system timer issues within its own network. As the FOA progressed, however, timer issues occurred outside of Nextel's system and these issues required substantial testing and adjustments to optimize data flow from Nextel's network, through the intervening networks, to the PSAP.

By mid-August, end-to-end connectivity testing with the LEC and the PSAP revealed that significant timer-related adjustments would be required to transmit the proper data stream from Nextel's network to the PSAP.[11] As already noted, the LEC was supporting Phase II for other wireless carriers in this market; consequently, the LEC's timers could not be adjusted since doing so might adversely impact other carriers' Phase II transmissions. Thus, modifying the timers in Nextel's and Intrado's networks afforded

[11] Nextel informed the Commission of these FOA issues on August 23, 2002. *See* In the Matter of Revision of the Commission's Rules To Ensure Compatibility With Enhanced 911 Emergency Calling Systems, Letter from Laura Holloway to Marlene Dortch, CC Docket No. 94-102 (August 26, 2002).

the greatest flexibility to quickly resolve synchronization issues and fully test end-to-end connectivity for Nextel's Phase II technology.

Nextel and Intrado determined that timer connections between the LEC's regional ALI database and Intrado's WNALI database were not optimized due to trunking Nextel was sharing with other Intrado customers. To segregate Nextel's E911 traffic at Intrado's WNALI and to obtain direct connections between the PSAP and the WNALI database for Nextel's E911 calls, Nextel and Intrado procured virtual private circuits that dedicate connectivity for Nextel E911 traffic, eliminating Nextel's dependency on other wireless carriers' connections to the WNALI database. Despite substantial resources devoted to this issue and all parties' best efforts to optimize the timer adjustments as soon as possible, the work continued through the middle of September.

The second week of September, almost three weeks after Nextel initially anticipated exiting the FOA, Nextel successfully transmitted its first, live E911 call to the York County PSAP during a 48-hour test period.[12] The live E911 test calls were successful, transmitting voice and location information to the PSAP as anticipated. After this 48-hour test, but prior to commercial deployment, Nextel verified its network stability, including testing of the geographic redundancy of its Phase II equipment. This testing ensures that in the unlikely event network equipment fails in one location, E911 calls will be routed through alternate equipment to minimize service disruption for emergency calls. Geographic redundancy involves three network components: (1) SS7 connections that direct voice based traffic between the SMLC/GMLC and the Signal

[12] The 48-hour test required re-routing Nextel's commercial customers in the York County area around the test sites to ensure no service disruption.

Transfer Point ("STP"); (2) the emergency services routing key ("ESRK") database; and (3) WNALI database links.

Although Nextel's geographic redundancy test plan was prepared and ready to implement at the end of August, the test could not be executed until a live E911 call was successfully completed on its network. By the third week of September—soon after the successful live E911 call—Nextel had validated the SS7 connections and the ESRK database; however, additional testing revealed issues in the connections to Intrado's WNALI requiring Intrado's troubleshooting. Intrado quickly and diligently resolved the database link issues to ensure a high level of redundancy between Intrado's WNALI and Nextel's SMLC/GMLC equipment. Intrado identified, resolved and repeatedly tested these WNALI database link issues; however, these additional delays, which like many others in the FOA could not have been predicted, meant that Nextel could not complete final geographic redundancy testing of its equipment until the closing days of September.

Throughout August and September while Nextel, the LEC and Intrado were troubleshooting and resolving the timer and connectivity issues, Nextel personnel also worked closely with York County PSAP officials to customize the format of certain Phase II location information delivered to the PSAP's customer premises equipment ("CPE"). The CPE's type, age and capability often vary among PSAPs; therefore, certain adjustments must occur to enable delivery of location information in a format suitable to the PSAP.[13] In many cases, working with individual PSAPs to customize information delivery adds additional complexity and time to the deployment process.

[13] Nextel's Phase II solution currently delivers the call back number and latitude and longitude of the wireless call's originating cell tower at call setup. After a caller's location information has been calculated using the A-GPS functionality in Nextel's network, the wireless caller's location information (expressed in latitude and longitude) is transmitted to the PSAP. After Nextel began discussing deployment and live

D. Post-FOA PSAP Deployment

Soon after Nextel Communications announced its successful testing in York County, Virginia, Nextel Partners began deployment activities in Cattaraugus County, New York. Nextel Partners worked with its MSC staff in Syracuse, NY to finalize an implementation plan that was developed from a three-day, end-to-end connectivity test which took place from September 23rd through the 25th. This testing resulted in identifying and documenting MSC pre-implementation groundwork for the remaining Nextel Partners' MSCs. During the testing, Nextel Partners tested ESRK assignments, legacy handsets and A-GPS assisted handsets, to ensure system functionality. After evaluating the output from these tests and the data provided by Nextel Communications, Nextel Partners determined it was ready for testing in Cattaraugus County, NY.

The initial call made on October 11, 2002 experienced similar timer issues with the Intrado WNALI database, as described above. The voice, ESRK and callback number were displayed on the PSAP screen, however the latitude and longitude were displayed with incorrect values. The first re-bid produced the latitude and longitude of the A-GPS handset, along with a confidence factor. Subsequent test calls provided similar results. The initial bid consistently displayed incorrect latitude and longitude data, while first and second re-bids displayed site latitude and longitude (Phase I) and A-GPS handset latitude and longitude (Phase II), respectively. The consistent behavior of the system allowed Nextel Partners to work with the PSAP, Verizon and Intrado to upgrade all cell sites and sectors to Phase II status. Nextel Partners is working with Intrado to eliminate the initial

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testing with PSAPs, it became clear that while some PSAPs can accept the cell tower latitude and longitude for Phase I information, others prefer to have the cell tower's textual street address. Thus, Nextel is working with a third party vendor to launch an addition to its Phase II solution by the end of the first

bid, incorrect data issue. The PSAP is aware of it and is satisfied with the action plan set forth and has signed off on a successful implementation.

E. Phase I Requests

With respect to the Commission's requirement that Nextel Partners provide "information on all pending Phase I and Phase II requests,"[14] Nextel Partners has attached Exhibit A listing all pending Phase I requests and their current status. Nextel Partners has fully deployed Phase I E911 service in 352 PSAP areas. For all on-going Phase I deployment efforts, Exhibit A provides a list of every pending Phase I request, the name of the PSAP, the date of the request, whether or not the request is valid, its status, an explanation of the delay if the request is older than six months, and an anticipated Phase I launch date.

F. Phase II Requests

Exhibit B addresses Nextel Partners' ongoing Phase II deployment efforts, providing a list of every pending Phase II request, the name of the PSAP, the date of the request, whether or not the request is valid, its status, an explanation of the delay if it is "on hold" and an anticipated Phase II launch date.[15]

Nextel Partners has received Phase II service requests in 126 PSAP areas and has asked that each of these PSAPs provide the documentation required in the *Richardson*

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quarter of 2003 which will enable PSAPs to receive Phase I information with the cell site textual street address as well as the cell site latitude and longitude.

[14] *See* Nextel Waiver Order at ¶32.

[15] Nextel Partners notes that the proposed deployment dates in Exhibit A and in Exhibit B are targeted launch dates, which Nextel Partners and the relevant PSAP are striving to meet. Nextel Partners is in regular contact with each of these PSAPs and is working to deploy Phase I and Phase II E911 as soon as possible, but for the reasons discussed herein, unexpected complexities can delay deployment despite the best efforts of all involved.

Order for determining the request's validity.[16] Nextel Partners' determination that a PSAP request is "valid" presumes, based on information provided by the PSAP, that all required LEC and PSAP infrastructure and upgrades—if not already in place—will be installed and ready for operation within six months of the request. Typically, Nextel Partners' experiences the biggest delay where the LEC is not technologically capable of handling Nextel's Phase II information.

Nextel Partners deployed Phase II service with Cattaraugus County, New York on October 11, 2002 and subsequently with Salem Police Department, Roanoke, Virginia on October 17, 2002. Nextel Partners expects Vigo County, Indiana to be fully launched early the week of November 4. At the same time, Nextel Partners is actively engaged with PSAPs at multiple locations and anticipates deploying Phase II service in additional areas, based on the dates set forth in the Exhibit. Furthermore, Nextel Partners has been in contact with all PSAPs that have filed a valid Phase II request, and both parties have mutually agreed to work toward the deployment dates reflected in Exhibit B.[17]

CONCLUSION

As required in the Nextel Waiver Order,[18] Nextel Partners is providing this Quarterly Report to the Executive Directors and counsel of the Association of Public Safety Communications Officials-International, Inc. ("APCO"), the National Emergency Number Association ("NENA") and the National Association of State Nine One One

[16] *In the Matter of Revision of the Commission's Rules To Ensure Compatibility with Enhanced 911 Emergency Calling Systems, Petition of City of Richardson,* Order, CC Docket No. 94-102, FCC 01-293, released October 17, 2001 at ¶¶14-16 ("*Richardson Order*").

[17] Some of the Phase II deployment dates that were listed on Exhibit B of Nextel Partners August Report are different in this Report. The revised dates are the result of lessons learned in Nextel's York County, Virginia FOA, and subsequent discussions with the PSAPs listed in Exhibit B.

[18] Nextel Waiver Order at ¶32.

Administrators ("NASNA"). Should any of these organizations or their individual PSAP members have questions or concerns about Nextel Partners' submission, Nextel Partners encourages them to contact Peter Gaffney, at the number listed below, as soon as possible to ensure rapid and efficient deployment of Nextel Partners' Phase I and Phase II E911 services.

Respectfully submitted,
Nextel Partners, Inc.

By: /s/David Thaler

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Plan of Nextel Partners, Inc.	)	

STATE OF MINNESOTA)
) ss.
COUNTY OF HENNEPIN)

AFFIDAVIT

David Thaler, duly sworn, deposes and states that:

1. I am the Vice President of Nextel Partners, Inc., with an address of 10120 West 76th Street, Eden Prairie, MN 55344, and with a telephone number of (952) 238-2500.

2. I hereby represent that the attached data regarding the status of Nextel Partners' E-911 Phase I and Phase II deployments are true and correct to the best of my knowledge, information and belief.

/s/David Thaler

David Thaler
Vice President-Business Operations

In witness whereof I have hereunto subscribed my name and affixed my official seal this 1st day of November, 2002.

/s/ Brent G. Eilefson
Printed Name: Brent Eilefson
NOTARY PUBLIC in and for the State of Minnesota
My Commission Expires January 31, 2005